



Metabolome variability in crop plant species--When, where, how much and so what?

Author(s): Davies HV, Shepherd LV, Stewart D, Frank T, Rohlig RM, Engel KH
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Abstract:

Omics technologies provide coverage of gene, protein and metabolite analysis that is unsurpassed compared with traditional targeted approaches. There are a growing number of examples indicating that profiling approaches can be used to expose significant sources of variation in the composition of crop and model plants caused by genetic background, breeding method, growing environment (site, season), genotype x environment interactions and crop cultural practices to name but a few. Whilst breeders have long been aware of such variation from tried and tested targeted analytical approaches, the broad-scale, so called "unbiased" analysis of the metabolome now possible, offers a major upside to our understanding of the true extent of variation in a plethora of metabolites relevant to human and animal health and nutrition. Metabolomics is helping to provide targets for plant breeding by linking gene expression, and allelic variation to variation in metabolite complement (functional genomics), and is also being deployed to better assess the potential impacts of climate change and reduced input agricultural systems on crop composition. This review will provide examples of the factors driving variation in the metabolomes of crop species.

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Resource Description

Exposure :

weather or climate related pathway by which climate change affects health

Food/Water Security

Food/Water Security: Agricultural Productivity

Geographic Feature:

resource focuses on specific type of geography

None or Unspecified

Geographic Location:

resource focuses on specific location

Global or Unspecified

Health Impact:

Climate Change and Human Health Literature Portal

specification of health effect or disease related to climate change exposure

Health Outcome Unspecified

Intervention:

strategy to prepare for or reduce the impact of climate change on health

A focus of content

Mitigation/Adaptation:

mitigation or adaptation strategy is a focus of resource

Adaptation

Resource Type:

format or standard characteristic of resource

Review

Resilience:

capacity of an individual, community, or institution to dynamically and effectively respond or adapt to shifting climate impact circumstances while continuing to function

A focus of content

Timescale:

time period studied

Time Scale Unspecified